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ILLINOIS STATE WATER SURVEY

Collection of Water Samples

Sample should be taken from a point as close to the well pump as possible and after the pump has been in operation for a sufficient length of time to remove the stagnant water.

Data needed for each sample: City MONSANTO County ST. CLAIR. Name of owner Monsanto Chemical Co Exact identification of well #8 (Mondo A Mark) Exact location of well Sample collected on (date) 4-16-43 at (time) 10:30 AIM after 24 hours pumping at 570 gal. per min. Tap used for sample*: (at well) storage tank, distribution system Depth of well 105 feet. Diameter 16 inches, Cased to 75 feet. Screen from 75 feet to 105 feet Where possible report also: Log of well_____ Date drilled 10-39 Well driller H.L. WATSON Major repairs Type of pump POMONA - 4 STAGE CENT. Hours or days in use per week 7 days Non-pumping level 37 feet. Pumping level 70 feet expressed as: * Mean Sea level. (Feet below top). Gage reading. Sea level elevation of top of well TOP OF BASE PL. ELEV. 99.27. Temperature of water 60° Sample collected by & Mc Elligott

*circle the correct designation.

For office use: Analysis No. 95988

SHORT PARTIAL ANALYSIS

5707V0W-26.W

Sample of water collected April 16, 1943 from wellowned by Monsento Chemical Co., Konsento, Ullinois. Well No. 9. Depth of walli 105'. Pate of pumping: REO172321.26, 24 hours. H. 10 W.

LABORATORY NO. 95989

Doterminations Made

Farts per Million Turbidity 100 Celor Odor Iron (unfiltereal 14.3 Chloride. 13.0 (hg CaUO_a) Alkalinity. Phenolphybalein 0.0 Hethyl Crange 392,0 Total Rardress (as CaCOa) 480 Total Mirgral Content Temperature 60° F. 554.1

STATE VATER CURVEY DI VISION

T. E. Lercon, Chemies

SHORT PARTIAL ANALYSIS

STC2NION-26.33

Eample of water collected April 16, 1943 from well owned by Menanto Chemical Co., Monganto, Illinois, well No. 10. Depth of well; 110 ft: Rate of pumpire; 700 gpm. after 24 hours.

NE 1/4 Beo. 26, T. 2 N., B. 10 V.

LABORATORY NO. 95990

Determinations Made

	بأورا فالمرأة للوطانية		* £.	rus pos
				llion
Turblaity				100
Color	on and the second			$\tilde{\mathbf{c}}$
Odor				Tr.
Iron		6		
(unfiltered)				45.2
Chloride	0	1		00.0
Alkolinity	ે (૧૯ ઇ	e.GOz)		
Flienolphthale	in			0.0
. Hethyl Orange	Y.		ya ya da da k	116.0
Total Hardness	(as C	a00a)		180
				336
Pemperature d				San Control
Nethyl Orange Total Hardness Total Mineral	(as C Conten			116.0 180

STATE WATER SURVEY DIVISION

T. E. Larcon Chemist

STC 2 NIOW 26.76

SHORT PARTIAL ANALYSIS

Cample of water collected April 16, 1943 from tall owned by Moneanto Chamical Co., Moneanto, Well No. 12, Depth of well; 110', Nate of pumping; 400 gra, ofter 24 hours.

NE 1/4 930. 28, 7. 2 H., R. 10 4.

LABORATORY NO. 95991

Diterminations Made

이 살았다는데 나무도 그렇는 사람들들은 이번 들어왔던 그는데, 함께	
Surbidity 100	. , . -
Color see that the state of the color see that the color	,
Odor All The Section of the College	
Trong to the fact that the second of the second	
(unfiltored) 17.6	
Chlordde Ci. 55.0	
When the $y \sim 3$ (as 30.00_3), $y \sim 3.00_3$	
Thenoly Linaloin 1000 1000 1000 1000	
Hothyl Orango 112.0	00 B
iotal liardness (as Oacco) 508 s	i d Les
Total Illneral Content 911	
Temperature 50% F.	

STATE WATER BURYLIX DIVISION

T. E. Larson, Charlet

CHORT PARTIAL ANALYSIS TO COLORS COLORS CO. Sample of water collected April 16, 1943 from coll organity Monacate Chemical Co., Honsanto, Illinois, Mell Ma. 13.

Depth of well: 195'. Rate of comping: 660 gpm. After 24 hours.

HE 1/4, Sec. 26, T. 2 H., R. 10 M.

LABORATORY NO. 05992

Determinations Made

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	.llion
함께 되는 것 같은 사람들이 되게 들면 보기를 하지만 그리고 되었다.	
Aurbigity and the second	100
	Q
'Odox' je postali, kaj je postaliji izalika ik	rochlah
Tron Fermi	
(unfiltered)	13.6
Chlorida	27.0
alkalinity (ar CaCC3)	
Thonolyhthaloin	0.0
Mothyl Orange	726.0
Total Hardness (as Cacoa)	530
Total Mineral Content	326
Temperature 60° M	
	Control of the Contro

STATE WATER SURVEY DEVESTOR

T. E. Larson, Chemist

TELL: AH

SHORT PARTIAL ANALYSIS

51C2NIOW-215-35.

Sample of water collected April 16, 1943 from well or had by Monganto Checkeal Co., Monganto, Illinois, Well No. 14, Depan of well: 105 . Rate of pumping: 540 cpm. attem 22 hours. HE 1/4, Sec. 26, T. 2 H. A. 10 W.

LABORALORY NO. 95993

Paragolisterminations indo

് പുട്ട കുട്ടും Balanca 100 0 Micagrossina

Inon-(unfiltered) 47.2 Chloseddo: 36.0 Alkalinity of (ac caucy)

Phonolphthaloin ະ ດູວ Nothyl Crange Lotal Hardness (as CaCO_a) Total Mineral Content Temperature 60° F. 270.0 726 1056.

Turbidity.

Color

Odor.

STATE WATER SURVEY DIVISION

T. N. Larcon, Checket,

SHORT PARTIAL ANALYSIS

3C2NION-26-26

Sample of vater collected April 16, 1943 floa coll comed by Moncanto Chamical Co., Moncanto, Miliacia. Nall No. 15. Depth of well: 106 7/2 feet. Nate of personal CEE gpin after 24 hours. No. 1/4 Sec. 28, 7, 2 H., R. 10

LABORATORY NO. 95994

2/0.23

Peterrinations Made

		isti	n por lon	
all braity			200	
Color		*14 72	i Septemble	
Leon	Fe			•
(unfiltered) = 0.11oride	133		21.3	
Alkalinity Firmolphthehel	(na GaGO ₃). n		0.0	
listhyl Orango.			462.0	
Total Hardness Total Hineral C	lontent		776.3 308.	
To corature 2 60		_	and the second	

STATE WATER SURVEY DIVISION

T. E. Lorson, Chemist

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SHORT PARTIAL ANALYSIS

16, 1943 from well anto Illinois.

Sample of water collected April 16, 1943 from well owned by Monsento Chemical Co., Monsento, Illinois.
Well No. 7. Depth of vell: 104 feet. Pate of pumping: 575 gpm. after 24 bours. NE 1/4 Sec. 28, T. 2 N., R. 10 N.

LABOTATORY NO. 96003

Determinations Made

Harts por

医巴利克勒 表现不多处理 海绵绵绵绵叶红色	为。2008年1月26日至4日的第二人	的是 4.170.755 504.42	
Turbidity	是公司的	经产生 使制度	100
Color			- 20
Odor		H	ediuin
Iron	Fo	第一人 建设的	
(unfiltered)			37.2
Chloride	C1		148.0
Alkelinity	las CaCoa		
Phenolphthalel	n	(2) (2) (2) (2) (2) (2) (2) (2) (2) (2)	0.0
Mathylalmanga			350.0
Total Hardness	(as CaUOa		770
Residue			1856.
the fact of the first first transfer of the first firs	O F		

STATE WATER SURVEY DIVISION

T. E. Larson, Chemist

BHORT PARTIAL ANALYGIB

57 ENION 26.39

Sample of water collected June 8, 1943 from well owned by Monsanto Chemical Co., Honsanto, Illinois. Well No. 8. Depth of well: 105 ft. Rate of pumping: 580 gpm. after 24 hours.

NE 1/4 3ec. 28, T. 2 N. H. 10 W.

LABORATORY NO. 90161

Determinations Made

	Parts Fer
	Killion
Turbidity	100 (4)
Color	o de
Caor	0
Iron (unfiltered)	6.9
Chloride 01	32.0
Alkalinity (ac CaCO,)	
Phenolphthalein Methyl Orengo	0.0
Total Hardness (as CaCoa)	465.0 807.8
Total Mineral Content	1465.0
Temperature 02° F.	

STATE WATER EURVEY DIVISION

T.E. Larson, Chemist

TEL! AB

SHORT PARTIAL ANALYSIS STORY Jample of vater collected April 1, 1943 from well owned by Noge Tie Co. Monsanto, well No. 1, Centerville, Kliinois. Depth of well: 100. Pate of pumping: 75 gpg. after 2 hours. N. R. 10 K. 25.70

LABORATORY NO. 95770

Determinations Mode

				res per
		元 第二章		illion
	\$7.50 M	以	经工艺工艺	
Turbidity	100	Laboration of		17
「っき」、ことに、これが一切。 自転車 管 いんこう 残め ほんし		建筑多层		
Color			没来多的	$\mathbf{O}_{\mathbf{A}}$
0dor				0
Iron	Fe	2 3 A 25 A		美洲
(unfiltered)				1.7
	° 37 - 14			to the state of th
Chloride				32.0
Alkalinity	(as Ca	CO ₃)		
Phenolphthale		to a	化学的设计	0.
Methyl Orange		的 表示了		396
Total Hardness		no Y		322
Total Minoral	Cont en	Single Control		469.
		在班上 主要	定理任务(1)	
		尼州 。 (14)		

Temperature 54° F

STATE FATER SURVEY DIVISION

T. E. Largon, Chemist

SI Claim

December 29, 1947

CHEMICAL ANALYSIS

5c 20100126

Sample of water collected December 12, 1947 from well owned by the Monsanto Chemical Co., Monsanto, Illinois. Location of well; 2160' B. & 340' W. of NE. corner, Section 26, T. 2 N., R. 10 V. Depth: 105'. Well No. 11.

LABORATORY NO. 112,885

	npm.	epm.			.mgg	epm
		British Cont.			ALA STATE	A.C
Iron (total) Fe	12.8		llica	S10,	37.0	
Manganose Ma	0.3		Luoride		0.3	
Calcium			loride	Cl	18.0	0.51
Magnesium Mg	40.6		itrato	NO.	0.1	Tr
Ammonium 1H.			liate	80	137.0	2.85
Sodium	15.6	0.68 A	ikalinity (a	as CaCOa)	360.	7.20
Turbidity	100	z rody jakov. Valski poslava tir	ardness (as CaCOa)	493.	9.85
Golor	7.50 A		esidus	as CaCOs)	603.	y.07
Odor	Chemic					

ppm. " parts per million

epm. - equivalents per million

ppm. x .0583 - grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Meter, Asst. Chemist

IV: AB

50,20 26,201 50,20

December 29, 1947

PARTIAL CHEMICAL ANALYSIS

Sample of water collected December 12, 1947 from Well No. 12 owned by the Monsanto Chemical Co., Monsanto, Illinois. Location of well; 2540' 8. & 1090' W. of NE. corner, Section 26, T. 2 N., R. 10 N. Depth: 105'.

LABORATORY NO. 112,886

pps. en.	DDM. opm.
Iron (total) Te 16.8	Chloride (1.47)
	Sulfate 50. 50. 145.4 3.03
Turbidity 100-	Alkalinity (as CaCoa) 416. 8.32
Color	Hardness (as CaCOs) 514. 10.28
Odor Chemical	Total Mineral Content 680.

ppm. = parts per million epm. = equivalents per million ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Heter, Asst. Chemist

IV:AB

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29, 1947 SC2010W-26.4e
ANALYSIS
ABber --

December 29, 1947

CHEMICAL ANALYSIS

Sample of water collected December 12, 1947 from Well No. 16 owned by the Monganto Chemical Co., Konsento, Illinois. location of well: 2240' St. & 2200' W. of NE. corner, Section 26, T. 2 N., R. 10 W. Depth: 109'.

LABORATORY NO. 112,888

	ppm. epm.		P	m. eds.
	的"大型"的"大型"。 第二章	Silica	S10.	15.2
Iron (total) Fo	15.2	Fluoride	F	0.4
Calcium	141.7 7.09	Chloride	Cl	34.0 n.96
Hagnesium Hg	37.2 3.06	liltrate		r.
Ammonium NH.	0.6 0.03	Sulfate		3.7 3.41
Sodium Ha	30.1 1.31	Alkalinity (as	CaCO ₃) 35	6. 7.12
Turbidity	100±	Hardness (as	CaCOa) 50	8. 10.15
Color	35	Residue		52.
Odor	Chemical			
Temperature 58° F.				

ppm. - parts per million

opm. - equivalents per million

ppm. x .0583 - grains per gallon

STATE WATER SURVEY DIVISION

Irene Van Heter, Asst. Chemist

TV: AB

Adlai E. Stevenson

STATE OF ILLINOIS DAMENTH GREEN, GOVERNOR

STATE WATER SURVEY DIVISION

ARTHUR M. BUSWELL, CHIEF

URBANA, ILL.

August 26, 1949

MONSANTO CHEMICAL CO.

East St. Louis, Illinois

Subject: Conference on industrial use of water

August 18, 1949

Mr. J. F. Stickley - M.C.C. Assistant Plant Manager Personnel:

Mr. J. P. Bufe - M.C.C. Utility Engineer for power

plant and water supply
Mr. H. E. Hudson - S.W.S. Civil Engineer
Mr. T. E. Larson - S.W.S. Chemist

Mr. R. P. Strout - S.W.S. Mechanical Engineer

Chlorine and caustic soda (NaOH) Products: Sulfuric acid (Numerous other minor products)

Chlorine is produced by a gas by passing an electric current through a solution of common salt in a Nelson Cell. The resulting caustic soda remains in solution.

Sulfuric acid is produced by the contact or catalytic process in which burning sulfur forms SO3 in the presence of vanadium catalyst combining with 98% sulfuric acid H2SO4, to form 99% sulfuric acid.

The municipal water company supplies approximately 2,000,000 gpd of soft water (130 ppm) to the plant.

Munidipal water is drawn from the Mississippi River.

City water is used for fire supply as insurance Co. considers it most reliable.

City water used in plant for sanitary purposes, as solvent in process water (dissolves salts), as make-up in evaporative cooling units.

BOARD OF NATURAL RESOURCES AND CONSERVATION

CHEMISTRY . . . ROGER ADAMS ENGINEERING - LOUIS R. HOWSON GEOLOGY . WALTER H. NEWHOUSE FORESTRY, LEWIS HANFORD TIFFANY BIOLOGY . . ALFRED E. EMERSON Ex Officio . THANK-S. THE-4FBON Ex Officio - PRES. G. D. STODDARD

* Noble J. Puffer

The plant draws about 10 Mgd. of water from its own wells.

The water level is reported not to have changed materially over a period of 40 years.

Well water is highly mineralized (13000 ppm) containing much iron (15-20 ppm.) which tends to clog heat exchangers particularly if exposed to air.

Water from 2 wells is treated with sulfur dioxide to delay precipitation of iron sludge.

Concentration of SO2 is maintained at 7 ppm.

Well water is used only for heat transfer cooling. In the cooling process the water is limited to a 25° F. temperature rise as a greater temperature increase would result in precipitation of the iron and CaCO₃ sludge, within equipment.

Both municipal and well supply are metered but plant desires a greater number of meters at points of use.

The temperature range of chemical processes is from -10° C. to 250° C.

The water system represents 2 to 4 percent of the total plant investment.

It is estimated that well water costs between 4 and 5 cents per 1000 gallons.

Major water equipment used for cooling consisted of:

Cell forced draft cooling towers for 1 spray pond for caustic separation 1 cascade evaporative condenser for SO₃ cooling.

R. P. Strout

Monsanto C	Chem. Co.
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Well No. 3

Drilled by H. L. Watson (Waly)

July 1941

Formations passed through	Thickness	Depth of bottom
Fill	10	
Mud	8	18
$\mathbf{\hat{Y}}$ ellow sand	10	28
Cray sand (getting coarser)	35	63
#30 sand	15	78
#40 gravel	5	83
#50 "	5	. 88
#60 ''	17	105 TD

Static level from surf 30' Screen Johnson Slot 40 Diam. 16 Length 30'

Monsanto ChemCo. (Plant "B")

Well No. 12

7 --

Drilled by H. L. Watson

Formations passed through		Thickness	Depth of bottom
No log		70	
Fine sand	•	5	75
Coarse sand and gravel		5	80 .
11 11 1	1 11	5	85
11 11 1	1 11	5	90
11 11 1	t ti	5	95
11 11 1	1 11	5	100
Sand and gravel		5	105
(1 11 11		5	110
Few boulders		2	112

Static level from surf. 39'6"
Tested capacity 1250 gpm
Screen Johnson
Slot 60-80-100
Diam. 16
Length 27 1/2